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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,964	09/21/2000	John Charles Dalrymple	8371-104	8324

20575 7590 04/08/2004

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EXAMINER	
THOMPSON, JAMES A	
ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 04/08/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/667,964	DALRYMPLE, JOHN CHARLES	
	Examiner	Art Unit	
	James A Thompson	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 21 September 2000 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application); the disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

Specification

2. The disclosure is objected to because of the following informalities:

It is replete with spelling and grammatical errors. Some examples include:

On page 5, lines 32, "on printed document 10 Figure 1" should be rewritten to correct for grammar.

On page 11, line 6, the sentence is an incomplete sentence.

Other spelling and grammatical errors are contained in the specification and the applicant is advised to correct these errors.

Appropriate correction is required.

Claim Rejections – 35 USC §112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 3 states that "the first set of seed values is generated using random noise." Claim 4 states that "the first set of seed values are generated using pseudo-random noise." Claims 3 and 4 both further limit claim 1. Therefore, the pseudo-random noise of claim 4 is distinguished from the truly random noise of claim 3. However, it is not possible to generate a truly random noise. Random number and random noise generators generate pseudo-random numbers and pseudo-random noise in order to approximate randomness. As normally defined in the art, "random noise" is simply a short way of referring to "pseudo-random noise." However, since the pseudo-random noise of claim 4 is distinguished from the truly random noise of claim 3, a truly random noise must therefore be the intention of claim 3. Applicant does not disclose how a truly random noise is created. Therefore, claim 3 is non-enabling.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 states that "the first set of seed values is generated using random noise" and claim 4 states that "the first set of seed values are generated using pseudo-random noise." Applicant fails to distinguish the difference between "pseudo-random noise" and "random noise." Both claim 3 and claim 4 further limit claim 1 and both claim 3 and claim 4 have similar language except for using "random noise" and "pseudo-random noise." Therefore, a proper distinction between random noise and pseudo-random noise is needed to avoid confusion. Furthermore, there does not exist a method to generate noise that is truly random. Random number and random noise generators generate pseudo-random numbers and pseudo-random noise in order to approximate randomness. As normally defined in the art, "random noise" is simply a short way of referring to "pseudo-random noise." Therefore, claims 3 and 4 as currently listed do not particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claims 10-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10-11 both state "[t]he computer readable medium of claim 7." However, claim 7 is a method and not a computer readable medium. Claims 10-11 as listed are therefore indefinite. For purposes of applying prior art to the claims, Examiner interprets claims 10-11 to mean "[t]he computer readable medium of claim 8."

8. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 states "c) using the seed values in the error buffer" but does not specify whether the error buffer is the first error buffer or the at least one other error buffer. The language of claim 12 is therefore confusing and indefinite.

Claim Rejections – 35 USC §102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Mintzer (US Patent 5,210,602).

Claim 2 further limits the method of claim 1. Claim 9 further limits the medium of claim 8. Claim 2 and claim 9 have essentially the same limitations. Claims 2 and 9 are therefore discussed together.

Regarding claim 1: Mintzer discloses a method for initializing a digital image reproduction system using error diffusion (column 5, lines 1-5 of Mintzer). Said method comprises initializing a first error buffer with a first set of seed values, wherein at least one of the seed values varies numerically from others of the seed values (column 7, lines 30-36 of Mintzer). The use of a random number generator to initialize the coefficients (column 7, lines 30-36 of Mintzer) provides a first set of seed values that vary numerically. Said random values are initially generated and stored for use with the error diffusion constants (column 7, lines 34-36 of Mintzer). Since random numbers are used to initialize the error diffusion filter (column 7, lines 30-36 of Mintzer), the error values stored initially in the error buffer are therefore randomized. The initial error values obtained using a randomized error diffusion filter can be considered the initial random seed values of the error buffer.

Said method further comprises using seed values in the error buffer to start an error diffusion process (figure 3 and column 7, lines 32-36 of Mintzer).

Regarding claims 2 and 9: Figure 3 of Mintzer shows that a random number generator is used for each color. The variables $k_{r,s}^{ck}$ and $c_{r,s}^{ck}$ respectively represent a constant and a coefficient at index r,s for color ck (column 5, line 22 and column 6, lines 42-46 of Mintzer), such as shown in some of the equations that are listed (column 6, lines 39-41 and lines 59-61; and column 7, lines 3-6 of Mintzer). Figure 3 of Mintzer shows the generation of random coefficients that are used in the processes shown in figure 2a, figure 2b, and figure 2c of Mintzer, which show a system for error diffusion for each color individually (column 4, lines 24-32 and column 7, lines 36-41 of Mintzer).

Therefore, a random number generator is used for each color (figure 3 of Mintzer). Therefore, Mintzer discloses that the method further comprises initializing at least one other error buffer with a different set of seed values (figure 3 and column 7, lines 30-36 of Mintzer), said error buffer corresponding to the error buffer of a different color.

Regarding claim 3: Mintzer discloses that the first set of seed values is generated using random noise (column 7, lines 31-36 of Mintzer).

Regarding claim 4: Mintzer discloses that the first set of seed values is generated using pseudo-random noise (column 7, lines 31-36 of Mintzer). As is well known and practiced in the art, a random number generator in principle generates noise that is actually pseudo-random noise, which is used to approximate random noise.

Regarding claim 5: Mintzer discloses that the pixel values for the first color and second color are modified based on the associated diffusion error values (column 5, lines 24-30 and lines 62-66 of Mintzer), which are derived from the random seed values (column 7, lines 30-32 of Mintzer). An error (δ_i) is calculated for the first color (column 5, lines 47-52 of Mintzer). Said error is then used along with a coefficient (α^{12}) to calculate the quantized output value of the pixel of the second color (column 5, line 66 to column 6, line 5 of Mintzer). The difference between the modified pixel value and the output pixel value of the second color determines the error in the pixel value of the second color (column 6, lines 6-12 of Mintzer). The error in the pixel value of the second color is then used to update the diffused error value for the second color (column 6, lines 34-41 of Mintzer). The coefficient (α^{12}) therefore correlates the first random seed error value, stored in said first error buffer, and the second random seed

error value, stored in said other error buffer. The error calculated using the coefficient (α^{12}) influences the quantization of the second color and is used to reduce graininess in the resultant color image (column 4, line 64 to column 5, line 1 of Mintzer). Therefore, the other set of seed values contains values negatively correlated with the values of the first set.

Regarding claim 6: Mintzer discloses that the initializing is performed in hardware (figure 3 and column 4, lines 33-34 of Mintzer). The random number generator used to initialize the error diffusion process (column 7, lines 34-41 of Mintzer) is shown embodied as a physical system, and is thus hardware (column 4, lines 33-34 of Mintzer).

Regarding claim 7: Mintzer discloses that the first pixel position for processing can be any pixel position within the image (column 5, lines 31-33 of Mintzer). The first pixel position where the error diffusion processing begins (column 5, lines 33-36 of Mintzer). In order to being error diffusion, error diffusion constants are required (column 5, lines 24-30 of Mintzer). Before error diffusion, said constants are initialized by multiplication with a random number (figure 3 and column 7, lines 30-33 of Mintzer). Since random numbers are needed to initialize the error diffusion constants (column 7, lines 30-33 of Mintzer), said error diffusion constants being needed before error diffusion processing can commence (column 5, lines 24-30 of Mintzer), then the initializing is performed at initialization of the printing system.

Regarding claim 8: Mintzer discloses a computer readable medium, the medium containing software code (column 5, lines 6-10 of Mintzer). If the processing

device is a personal computer (column 5, line 9 of Mintzer), then for the method to be performed, some form of computer readable medium containing some form of software code is inherently required.

Said software code comprises code for initializing a first error buffer with a first set of seed values (column 7, lines 30-36 of Mintzer). The use of a random number generator, embodied as random number generating code since said processing device is a personal computer (column 5, line 9 of Mintzer), to initialize the coefficients (column 7, lines 30-36 of Mintzer) provides a first set of seed values. Since random numbers are used to initialize the error diffusion filter (column 7, lines 30-36 of Mintzer), the error values stored initially in the error buffer are therefore randomized. The initial error values obtained using a randomized error diffusion filter can be considered the initial random seed values of the error buffer.

Said software code further comprises code for using the seed values to start an error diffusion process (figure 3 and column 7, lines 32-36 of Mintzer).

Claim Rejections – 35 USC §103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mintzer (US Patent 5,210,602) in view of Ball (*Sam's Teach Yourself Linux in 24 Hours*, by Bill Ball and Stephen Smoogen, Sam's Publishing, copyright 1998).

Regarding claim 10: Mintzer discloses that a personal computer is used as a processing device (column 5, lines 6-10 of Mintzer), thus inherently requiring some form of software code on some form of computer readable medium in order to perform any error diffusion processing operations.

Mintzer does not disclose expressly that said computer readable medium is a compact disc.

Ball discloses using a compact disc (CD-ROM) to access files and programs (page 32, lines 4-5; and page 33, lines 2-3 of Ball).

Mintzer and Ball are combinable because they are from the same field of endeavor, namely the manipulation of digital computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform image processing by executing software code stored on some form of computer readable medium, as taught by Mintzer, said medium being a compact disc, as taught by Ball. The motivation for doing so would have been that a compact disc is a commonly used medium on which to put computer data and software (page 32, lines 4-5 of Ball). Therefore, it would have been obvious to combine Ball with Mintzer to obtain the invention as specified in claim 10.

Regarding claim 11: Mintzer discloses that a personal computer is used as a processing device (column 5, lines 6-10 of Mintzer), thus inherently requiring some form

of software code on some form of computer readable medium in order to perform any error diffusion processing operations.

Mintzer does not disclose expressly that said computer readable medium is a downloadable file.

Ball discloses retrieving downloadable files (page 194, lines 8-13 of Ball).

Mintzer and Ball are combinable because they are from the same field of endeavor, namely the manipulation of digital computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform image processing by executing software code stored on some form of computer readable medium, as taught by Mintzer, said medium being a downloadable, as taught by Ball. The motivation for doing so would have been that it is easy to remotely obtain needed computer files by downloading files from the Internet or a server (page 194, lines 9-10 of Ball). Therefore, it would have been obvious to combine Ball with Mintzer to obtain the invention as specified in claim 11.

13. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mintzer (US Patent 5,210,602) in view of Shu (US Patent 5,757,976).

Regarding claim 12: Mintzer discloses a method for initializing a digital image reproduction system using error diffusion (column 5, lines 1-5 of Mintzer). Said method comprises initializing a first error buffer with a first set of seed values (column 7, lines 30-36 of Mintzer). Said random values are initially generated and stored for use with the error diffusion constants (column 7, lines 34-36 of Mintzer). Since random numbers

are used to initialize the error diffusion filter (column 7, lines 30-36 of Mintzer), the error values stored initially in the error buffer are therefore randomized. The initial error values obtained using a randomized error diffusion filter can be considered the initial random seed values of the error buffer.

Said method further comprises using seed values in the error buffer to start an error diffusion process (figure 3 and column 7, lines 32-36 of Mintzer).

Mintzer does not disclose expressly initializing at least one other error buffer with an alternate set of seed values, wherein the alternate set of seed values varies numerically from the first set of seed values.

Shu discloses selecting one of multiple error diffusion filters (figure 9(930) and column 12, lines 8-15 of Shu) which are used to create the error diffusion values (column 12 lines 20-23 of Shu). The error diffusion filters each have different error diffusion weighting values (figures 4A-4B; figures 5A-5B; and column 4, lines 45-54 of Shu). Said error diffusion filters are adaptively applied to selected input image pixels in response to the grayscale color tonal values of the pixels (column 7, lines 3-6 of Shu).

Mintzer and Shu are combinable because they are from the same field of endeavor, namely error diffusion processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to create at least one alternate error diffusion filter connected to the error diffusion filter of Shu, which would thus create an alternate set of seed values for the error buffer, and include said error buffer as an alternate error buffer in the system taught by Mintzer. The motivation for doing so would have been to be able to adaptively select error diffusion filters, and thus the set of

seed values, based on the grayscale color tonal values of the pixels in the image under consideration (column 7, lines 3-6 of Shu). Therefore, it would have been obvious to combine Shu with Mintzer to obtain the invention as specified in claim 12.

Regarding claim 13: Mintzer discloses that the first set of seed values further comprises replicas of a constant (column 7, lines 30-32 and lines 38-41 of Mintzer). If a set of constants are used for the error diffusion coefficients (column 7, lines 30-32 of Mintzer), then the first set of seed values would comprise replicas of a constant.

Further regarding claim 14: Mintzer discloses that one set of constants are used for the error diffusion processing of the first color (figure 2a and column 6, lines 34-41 of Mintzer) and another separate set of constants are used for the error diffusion processing of the second color (figure 2b and column 6, lines 56-61 of Mintzer). Since the set of constants for the first color and the set of constants for the second color are separate and distinct sets of coefficients used for processing a specific color, then the set of seed values corresponding to the second color comprises replicas of a different constant than the constant corresponding to the first color.

Mintzer does not disclose expressly that the alternate set of seed values comprises replicas of a different constant than that used in the first set.

As discussed above in the arguments regarding claim 12, which are incorporated herein, Mintzer in view of Shu discloses an alternate error buffer with an alternate set of seed values.

Mintzer and Shu are combinable because they are from the same field of endeavor, namely error diffusion processing. At the time of the invention, it would have

been obvious to a person of ordinary skill in the art to apply a different set of constants, as taught by Mintzer, as the alternate set of seed values in the alternate error buffer, as taught by Shu. The motivation for doing so would have been to be able to adaptively select error diffusion filters, and thus the set of seed values, based on the grayscale color tonal values of the pixels in the image under consideration (column 7, lines 3-6 of Shu). If the same set of constants were used for the first set of seed values and the alternate set of seed values, then the adaptive selection of said first set or said alternate set would not produce a different relevant result. Therefore, it would have been obvious to combine Shu with Mintzer to obtain the invention as specified in claim 14.

Regarding claim 15: Mintzer discloses error buffers, each error buffer for each of a plurality of colors (figures 2a-2c; and column 6, lines 42-46 and lines 62-68 of Mintzer). Each error buffer contains a set of coefficients that may be constants or random numbers (column 7, lines 30-33 of Mintzer).

Mintzer does not disclose expressly that said at least one other error buffer further comprises three error buffers, wherein each set of seed values in each buffer further comprise replicas of constants, each buffer having a different constant.

As discussed above in the arguments regarding claim 12, which are incorporated herein, Mintzer in view of Shu discloses an alternate error buffer with an alternate set of seed values.

Mintzer and Shu are combinable because they are from the same field of endeavor, namely error diffusion processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use three error buffers, one for

each color, as taught by Mintzer, in conjunction with the alternate error buffer taught by Mintzer in view of Shu. Each error buffer would contain a set of constants, as taught by Mintzer. Since each error buffer is applied to a different color, the constant for each error buffer would inherently have to be different. The motivation for doing so would have been to be able to perform error diffusion for each of the colors that are used to represent the color image (column 7, lines 13-18 of Mintzer) and to be able to adaptively select error diffusion filters, and thus the set of seed values, based on the grayscale color tonal values of the pixels in the image under consideration (column 7, lines 3-6 of Shu). Therefore, it would have been obvious to combine Shu with Mintzer to obtain the invention as specified in claim 15.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bowers et al., US Patent 5,107,346, April 21, 1992.

Peter W. Wong, US Patent 5,561,751, October 1, 1996.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

JAT
April 2, 2004

THOMAS D
LEE
PRIMARY EXAMINER